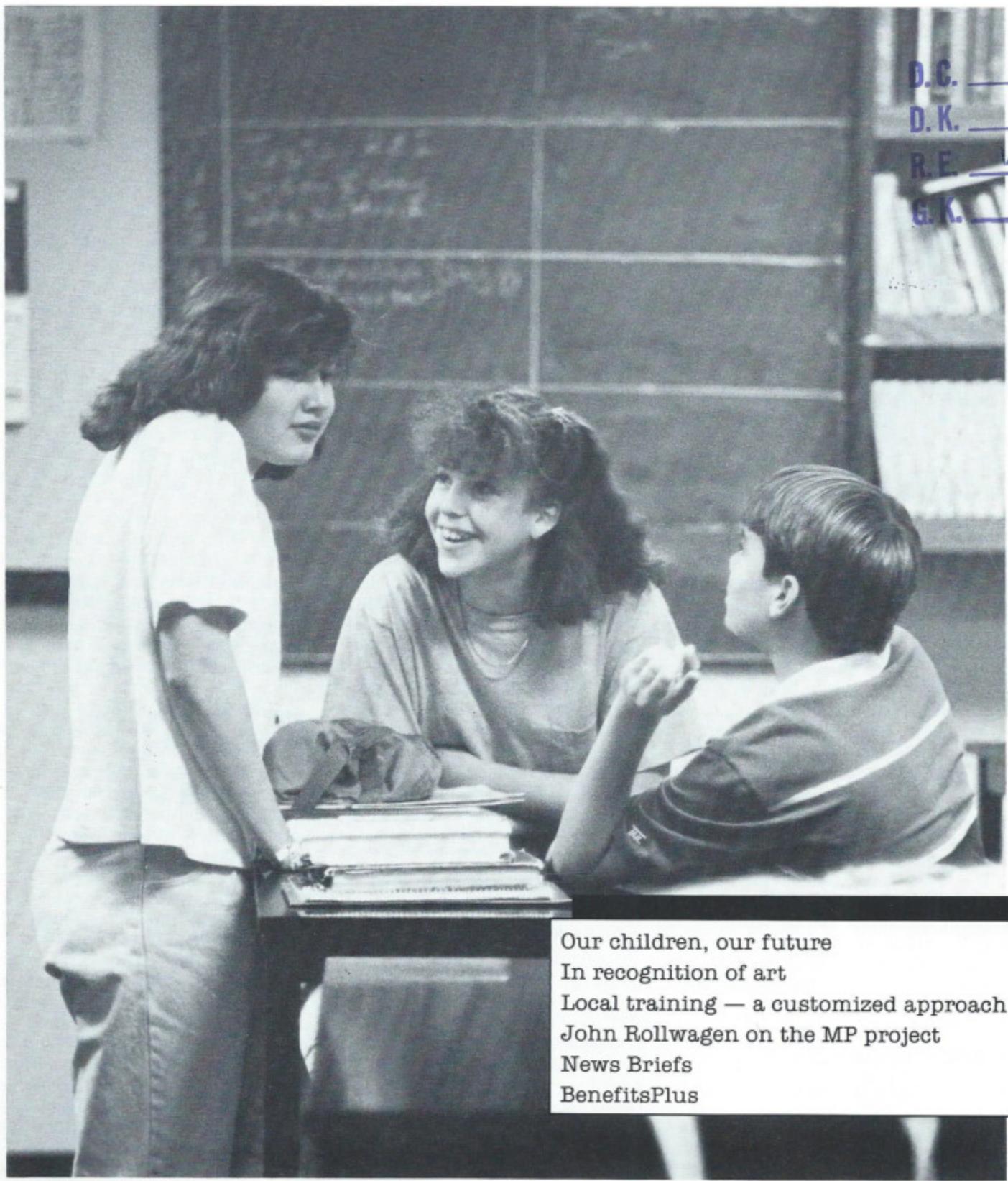


# interface....

A Cray Research, Inc. publication

November 1987



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The Wisconsin Educational Partnership Initiatives program's intent is to improve science, math, and technology education for students like Chris Frasch, Dave Frasch's seventh-grade son, and his friends at Chippewa Falls Middle School.



## Our children, our future

All industrialized countries are in competition for economic well-being. In part, this competition is driven by technology. Two disciplines important to technological success are math and science. And this is where U.S. concern arises.

The average twelfth-grade math student in Japan outperforms 95 percent of comparable U.S. twelfth graders. U.S. eighth graders are well below international norms in solving problems that require higher-order thinking skills. In fifth grade, the highest average math achievement in typical U.S. schools is below the lowest average scores from similar schools in China and Japan. Even in kindergarten and first grade, obvious differences emerge.

### **WEPI begins...**

Are U.S. schools among the best in the world? "Clearly they're not," says Bill Linder-Scholer, executive

director of the Cray Research Foundation. "But we can try to curtail the problem at the elementary, junior-high, and high-school levels."

To work with this nationwide challenge, Cray Research, Inc., in partnership with the Cray Research Foundation\*, has initiated the Wisconsin Educational Partnership Initiatives (WEPI). WEPI's intent is to improve science, math, and technology education for students in the

\*\*\*\*\*  
**"WEPI's objective is to assist schools in their endeavor to enhance scientific and technological literacy."**  
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U.S. from kindergarten through twelfth grade. The Cray Research Foundation Grants to Education Committee, a subset of the Cray Research Foundation, has authorized \$680,000 in charitable grants over the next two years. These grants are intended to help rework classroom curricula and to develop interfacing

strategies for teaching staff development. "The overall objective," explains Bill, is to assist schools in their general endeavor to enhance scientific and technological literacy."

### **On the home front, for starters...**

The logical starting point for the company's first major effort is the public and parochial schools located in cities where employee populations are the largest — Chippewa Falls, Rice Lake, and Eau Claire, Wisconsin.

David Frasch, technology counsel and a member of the company's Foundation Grants Advisory Committee, says, "A significant number of employees live in northwest Wisconsin. WEPI started with a regional emphasis so that we could measure the impact of our efforts. We are conscious of the fact that we live here — our families are part of the educational program. We plan to offer summer seminars, summer training sessions, and mobile resources to the entire northwest Wisconsin

area in the near future. WEPI is a well-researched plan that reflects Cray Research's interest in science, math, and engineering education. In addition, it shows the company's commitment to students and teachers, and to the Chippewa Valley area and neighboring communities.\*

## People power

The Cray Research Foundation is the financial vehicle used for funding WEPI. For the program to be effective, however, a partnership between Cray Research, Inc. and the Cray Research Foundation is imperative. While the Foundation provides the financial resources, Cray Research, Inc., the company, provides facility space and employee involvement. "We wouldn't be able to do some of the things we're doing, and the program wouldn't be as strong as it is, if Cray Research, Inc. weren't involved. Cray Research provides the people power," explains Bill.

Edna Bunn, executive assistant, is one such volunteer. As a member of the Foundation Grants Advisory Committee, Edna arranges WEPI tours of Cray facilities. "We started with math and science teachers, but there has been so much interest in the program that teachers from all academic disciplines are getting tours. Close to 90 teachers attended the tours in August," Edna says.

Steve Hogseth, head mechanical engineer on the CRAY-2 project, represents the technical side of the WEPI initiative. He was one of six engineers sponsoring the shadowing program last summer. "We had six high-school teachers come in and spend a day with a Cray Research engineer to find out how math and science gets used on the job," he explains. "For example, I met with a physics teacher. He and I planned the day to meet his goals. We spent the day discussing many aspects of the CRAY-2 system and examining related manufacturing procedures. The objective was not necessarily to

give him information to take back to the classroom, but to give him a better feel for the variety of skills and technologies needed to produce a supercomputer. By the end of the day, I think he had a good sense of the hands-on aspects of building and running a CRAY-2 system. I tried to help the teacher see the mix of

**"WEPI is a well-researched plan that reflects Cray Research's interest in science, math, and engineering education."**

practicalities and science, and I hope that this mix can be applied to textbook theory back in the classroom."

## Playing on strengths

One of WEPI's goals is to re-energize the educational system, with a focus on teachers. When the Foundation committee members made the decision to help fund math, science, and technology education, they knew that much of the effort still would have to come from the schools and their teachers.

"We'd like to see the schools work together and let them — each in their own way — be experts," explains Bill. "For instance, the Chippewa Falls schools have a terrific biology program, so they will be able to share that with all the other schools. We promoted teacher collaboration by getting teachers together at open houses. We also encouraged teachers to invite colleagues from other districts to the in-service training sessions."

WEPI's ambitious "to do" list features many other teacher-training plans. "We're going to have more tours and advisory involvement with teachers, talks in the classrooms, and a lot of Cray Research employee involvement," continues Bill. "We're giving schools and teachers money to achieve their own goals, and we're giving them money to accomplish some of our own objectives. We're

talking to higher-education institutions, and we're asking them to help us design the 'Cray Academy', an annual teacher professional-development program."

## Company and employee philanthropy

WEPI adds a new facet to the corporate giving spectrum. It represents a corporate grant-making program that is focused on science and technology education and reflects the interests of both employees and the company.

The establishment of the Wisconsin Educational Partnership Initiatives is consistent with the company's overall business objectives and with its philanthropic focus on education. In the past six years, Cray Research, Inc. and the Cray Research Foundation together have

**"We wouldn't be able to do some of the things we're doing, and the program wouldn't be as strong as it is, if Cray Research, Inc. weren't involved."**

donated more than \$5.2 million directly to educational organizations across the country. The Wisconsin Educational Partnership Initiatives is a major part of Cray Research's philanthropy. ●

\*The Cray Research Foundation, initiated in 1981, awards grants and scholarships to educational systems nationwide. Its committee members are: Bob Gaertner, Liz Wierum, Bill Linder-Scholer, Edna Bunn, Dave Frasch, and Steve Hogseth.



# In recognition of art

It all began on April 6, 1986 — the fourteenth anniversary of supercomputer company Cray Research, Inc.

A photographer was commissioned to create a piece of art. This artwork took the form of a book — a book depicting a people, a company, a community, a style — through photographs.

The artist finished his work in the spring of 1987. And since the date of its official birth on April 6, 1987, this piece of art has experienced a lifetime of review — both negative and positive, but primarily the latter.

To learn more about the production of this book, everyone is invited to listen to artist Lee Friedlander and his production assistant Richard Benson discuss their thoughts on *Cray at Chippewa Falls*. This discussion will be followed by the opening of an exhibition of photography by Lee Friedlander from this book commissioned by Cray Research.

This event will take place on December 5, 1987, at the Minneapolis Institute of Arts. The discussion will begin at 6 p.m. in the Pillsbury Auditorium. The exhibition opening will follow at 7 p.m. All employees are invited to attend to learn more about the creation of *Cray at Chippewa Falls*.

## In search of the perfect gift

The story of *Cray at Chippewa Falls* started in the spring of 1986. For several years, John Rollwagen had been exploring the idea of having photographer Lee Friedlander do a project for Cray Research. He also was in search of an idea for the

1986 employee gift. He had in mind a unique gift that would reflect his appreciation for everyone's efforts in making 1986 a superb year and that also would commemorate the company's fifteenth anniversary.

And that is where the story begins... Tina Bonetti, director of corporate communications, and Jim Morgan, manager of corporate graphics, came up with the idea of having Lee Friedlander, a world-renowned photographer and one of John Rollwagen's favorites, create a book about Cray Research in Chippewa Falls as the 1986 employee gift. A little research revealed that the project, even one as seemingly large as this, would be fully in line with previous employee gifts in terms of budget, so why not? John Rollwagen commissioned the project.

Shortly thereafter, Lee Friedlander traveled to Chippewa Falls to preview his project. He liked what he saw. He said that walking into wiring in manufacturing gave him an incredibly affectionate feeling — a feeling of people working together toward a common goal. Lee responded to his

  
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*The Metropolitan Museum of Art*

"It is a remarkable document, and a beautiful object...What an inspired idea it was to create this book, and how generous of Cray it is to then share its, and Lee Friedlander's, creation with us!"

  
**CENTRE  
NATIONAL  
DE LA PHOTO  
GRAPHIE**  
 MINISTÈRE DE LA CULTURE

*The Museum of Modern Art*

"I love the book, and think it was a brilliant idea to have Friedlander (with his cool eye and warm heart) do it....It is to my eye a marvelous book, beautifully manufactured, and I hope that the people at Cray enjoy it thoroughly."

instincts and on April 6, 1986, he began to work on the book.

It's been history from there. Lee traveled to Chippewa Falls four times after that initial visit. Each time he stayed for a week. His instructions from John were very much in the Cray Style: "I want you to do a book for the people here — go to it."

The resulting project is a book that has been admired, despised, adored, thrown away, and permanently preserved. It's been reviewed in a variety of media forms — radio, newspaper, and the most recent — magazine articles in the *Mpls./St. Paul, Twin Cities*, and *American Photographer* magazines.

And finally, as a critic recently shared with the rest of the country on National Public Radio, "For the people of Cray Research, Lee Friedlander has created a memorable gift." •

### Who is Richard Benson?

Richard M.A. Benson is a professor of photography at Yale University. He works as Lee Friedlander's technical partner on all of Lee's book projects.

Richard is preserving the craft of hand-developing halftone negatives used in the process of printing fine-art photographs. He is a recipient of a 1986 "Genius Grant" from the MacArthur Foundation for his work in the preservation and application of photographic technologies of the past.

### The voice of the critics...

When *Cray at Chippewa Falls* was released, reactions varied. Below, however, are comments that seem to reflect the consensus of feelings...

From The Art Museum in Princeton, New Jersey: "It is a stunning work — one of the finest collections of Lee's photography yet published."

From the Laurence Miller Gallery Inc., New York: "It is a handsome book, but more importantly, it is a symbol of what can be accomplished when resources are placed in the proper hands."

From the Center for Creative Photography in Arizona: "*Cray at Chippewa Falls* was an intelligently conceived project and a beautifully produced book. . ."

From Lee Friedlander admirer Michael Burns of Seattle, Washington: "I have just seen the magnificent book *Cray at Chippewa Falls*, by Lee Friedlander... I would like to applaud the Cray company for its wisdom and vision in having an artist such as Friedlander explore his profound vision on this project. There are many who find his work difficult, but the more one looks at the photographer, the more a taste develops for those images that can only be made by the camera in the hands of one who eschews the trite, banal, and common in favor of the stark and beautiful truth."

And from the Metropolitan Museum of Art in New York City: "What an inspired idea it was to create this book, and how generous of Cray it is to share its, and Friedlander's, creation with us!"

### George Eastman House

"I have long been an admirer of Lee's work, and I think that this is a most special publication. In a way, it is a perfect review of his style and approaches to differing subjects.

I think this publication is a wonderful way of celebrating your company's anniversary, and congratulate you on your choice of artist."

"I feel he is one of the most accomplished contemporary American photographers. Your publication re-affirms my view of his work and is, in addition, a very attractive presentation of the various directions he has pursued."

San Francisco  
Museum of  
MODERN  
ART

# Local training — a customized approach

Chippewa Falls and Mendota Heights still serve as Cray Research's central hardware and software training centers. Training, however, like other important functions at Cray, is going local — by going global. This year marks the third year of organized efforts to train more Cray customers and technical employees near their workplaces in North America, Europe, and Japan.

The training departments in Chippewa Falls and Mendota Heights continue to provide most of the technical training given to North American customers and employees. The company's field organizations, however, are taking on more responsibility for software training, especially customer training at the user level. Hardware training offered to Cray employees in North America will continue to be centered in Chippewa Falls because of the difficulty regions have in accessing hardware resources. The amount of training the field ultimately will do depends on how much success the field experiences as decentralization evolves.

The original plan to decentralize training was designed to phase in over five years. "But in some ways, the process is already complete," says Phil Hernick, software training manager. "Physically, everything is in place. Every field unit now has a software training manager or coordinator. And most field units have a hardware training manager

or coordinator. Some organizational matters, however, still are being worked out."

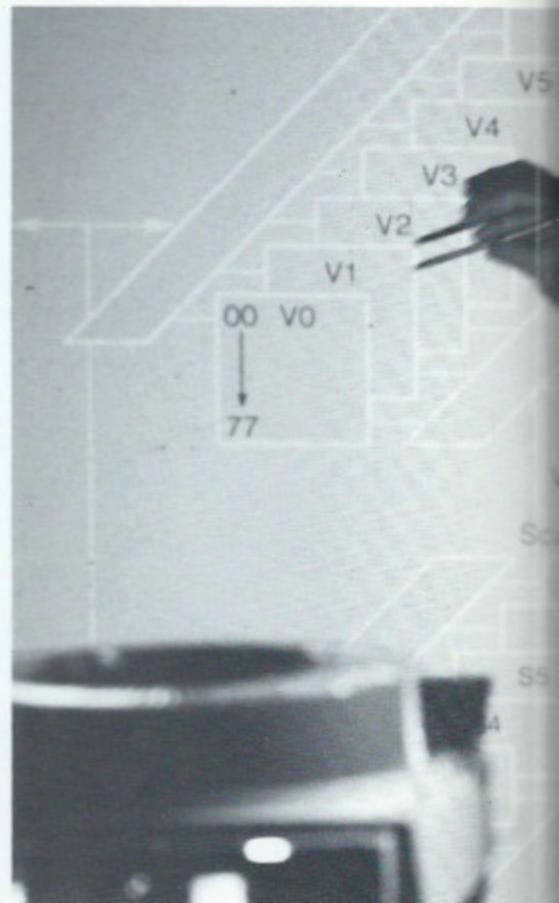
Whatever level of local training emerges as the decentralized effort's final form, it will benefit Cray Research and its customers in several ways.

## A local benefit

As Phil sees it, customers are the primary beneficiaries of local training. "Local training," he says, "expands the post-sales customer support team to include a training manager or coordinator. This person can perform a needs analysis with each customer and tailor training to each customer's needs. A needs analysis might take into account the learning styles of the operators, the users, and the analysts at the site. It can determine whether they prefer self-teaching materials or more formal classroom instruction, week-long or shorter sessions, half or all-day classes, and so on."

## Region efforts

"Training customers locally has the greatest benefit for students at the user end," explains Joan Watkins, eastern region software training manager, "and so this is where local training has concentrated. Analysts, system administrators, and other people who work with system software probably will continue to be trained in Mendota Heights, where they can access hardware more easily."



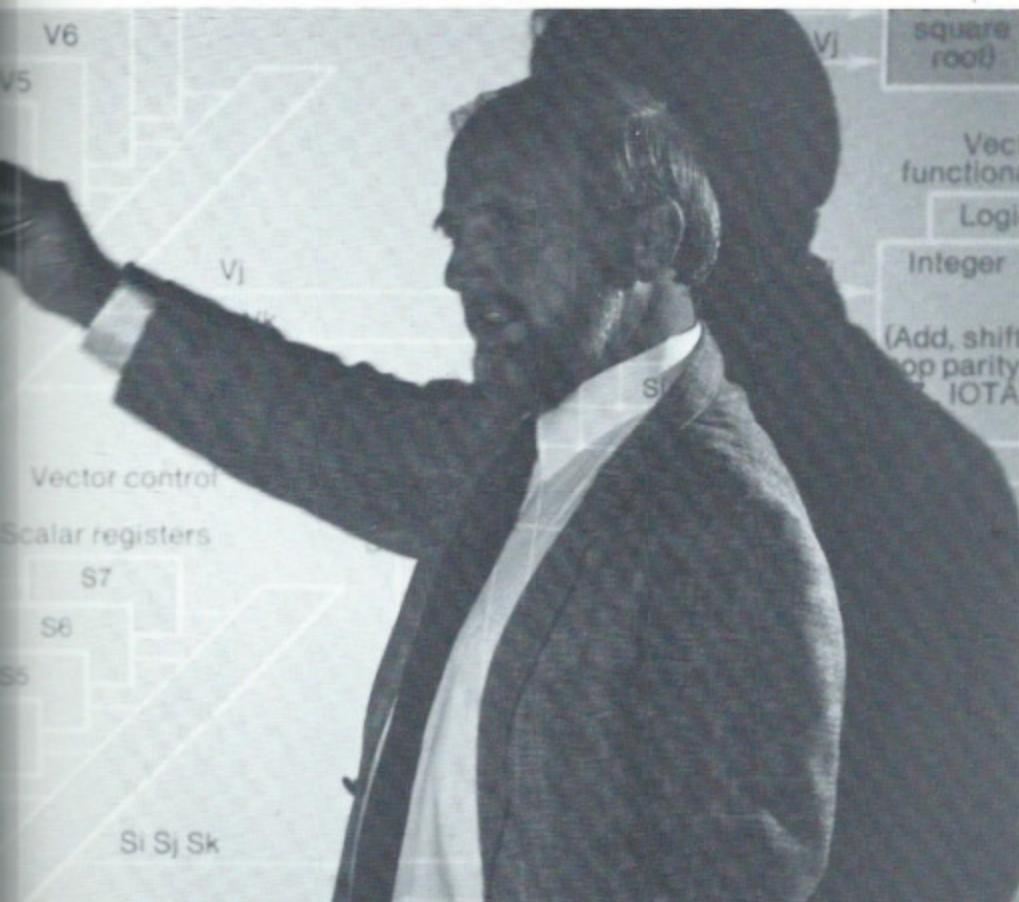
*Paul Martin, a software instructor in Mendota Heights*

Prerequisite and continuation training is emerging as the type of hardware training most suitable for U.S. field units, says Tom Crapisi, manager of hardware training.

"Continuation training is for people who have been on site for two or three years," Tom explains. "It includes advanced and refresher courses for those people who already have learned and practiced the basic skills."

## And overseas

The company's European and Japanese subsidiaries, motivated largely by distance and language considerations, were quick to develop a wide range of technical training courses.



Mendota Heights, explains the CRAY-2 system block diagram.

As a result of this initiative, Cray France was able to provide software training for over 600 students in 1986, most of whom were customers, and Cray Germany was able to train nearly 50 software students. Nevertheless, in 1986, 12 percent of the hardware students trained in Chippewa Falls and 16 percent of Mendota Heights' software students were from outside the United States. Even though the international field units are taking on more responsibility for user training, it appears that Mendota Heights and Chippewa Falls will continue to play a large role in the subsidiaries' overall training efforts.

### The need

Meeting some of the company's training needs locally is becoming increasingly important as the number of people requiring Cray training courses grows. "In 1979, we had 58 students in hardware training. That number grew to 206 in 1983, and to 420 in 1984," tallies Jim Nelson, director of technical operations. Software training had grown from 285 students in 1980 to 1,010 students in 1984 with customers being about 30 percent of the load. During the same period, on-site customer training requirements were increasing

dramatically and are expected to continue to increase at a brisk pace. In 1987, over 2,300 students will be trained at Mendota Heights. The field will train over 2,000 students during the year, with an additional 700 students trained in the field by instructors from Mendota Heights.

"We had to find new ways to accommodate the growing number of people who needed training," continues Jim. "Training customers and employees on site can be cost effective, and it gives field units the freedom to customize programs for individual sites. Our global plan calls for ramping up the regional and country training expertise over time with the central training departments assisting where possible. And now at the end of 1987, we have a large group of very knowledgeable people who work as a team to help plan, implement, and critique technical training throughout the company."

An important benefit that Cray Research gains from these efforts is a higher level of customer satisfaction. The sooner customers can take full advantage of their Cray systems, the sooner they will meet their challenges, whether designing a new airplane, a new electronic component, or a new medicine. And the sooner customers take full advantage of their Cray systems, the sooner they discover the value of a system upgrade.

"Within the past year, this project has taken on a life of its own," concludes Phil Hernick. "At first some field units were not sure they needed a managerial-level training position. But now that the local training managers are in place, the field is offering many suggestions to the centralized programs in Mendota Heights and Chippewa Falls. I think this exchange of ideas and information between the field and the centralized training departments makes a healthy contribution to Cray Research." •

## John Rollwagen on the MP project

On September 2, Cray Research announced the cancellation of the MP project in Chippewa Falls. The company has since gone through an extremely difficult period of adjustment, but the period prior to the announcement was just as painful. To fill you in on the events leading to the announcement and to follow up with recent changes, *Interface* talked with John Rollwagen about his thoughts on the event.

**Interface:** Concerning the MP project cancellation, first, why did it take so long to make the decision? And second, when the decision finally was made, why did events unfold so quickly?

**John:** First, you have understand the history of this project to put it into perspective, and then, you have to put it into the context of how things work at Cray Research.

We're organized to provide a lot of autonomy — a lot of freedom to take risks and to take on major objectives. Any of our project teams have a lot of freedom, and by definition, have a period of time to either prove themselves or not prove themselves.

The idea of diversity is particularly important in this context because it means that different people work in different ways, and that's well and good.

So, looking at the cultural and the technical issues of the MP project, some problems became apparent as much as a year ago. But just because something is different from the way we've done things before — or feels uncomfortable in some way — doesn't mean that we want to rush right in and make a change. We'd like to provide a lot of leeway before a project is either completed or cancelled.

That's why it took a while to make this decision. And then of course, once things are done, they're done. The question that caused the MP project to come under scrutiny was not whether or not the project should

continue — nor was it a technical issue. What happened is that as a company we had to find ways to reduce our budgets this year because of the somewhat lower growth in revenue this year than we expected. We wanted to take \$20 million out of the 1987 budget to reduce the growth in expenses; in other words, we wanted to postpone some expenditures or to hold back a little bit on spending for the year. When this happened, I asked Steve to participate. Specifically, I asked him to cut his project's \$16.5 million budget by \$1 million.

At first, Steve was reluctant on the logical basis that his was a futuristic project that would not have a payoff overnight and should not be subject to short-term financial measures. I agreed with that in principle, but I said that we're all in this together, and I felt it was very important that his group be seen as sensitive to a short-term company-wide problem and contribute. So Steve came up with a list of items to take out of his budget that would have some impact on his project but nothing too major. I was very pleased.

About two weeks later he came back and said "We will take those items out of the budget, but we'll still only be able to maintain our original budget." That's when I learned that he already had 180 people in the program versus the authorized 143 for the whole year — and this was only July! The other thing he said was that in 1988 — based on his staffing needs and the level of activity — there was no way he could hold his budget growth to fifteen percent. It was going to have to increase substantially — probably 30 or 40 percent above the original budget I was trying to cut in the first place! It was clear that we had a severe financial problem. That was the first thing but still wasn't enough to say "cancel the project."

What it really took was that, based on the financial situation, we decided to take a closer look at the project.

We thought, "We may need more money than we thought. But if we can get this project completed, it's a worthwhile investment." Still we decided we'd better look at it very carefully to make sure it was the right thing to do — particularly in an environment where everybody else is cutting back.

The executive committee spent a full day reviewing the MP project from top to bottom on a technical basis. Steve was very cooperative with us in the discussion. It became apparent, however, that we had a problem technically. The whole technical philosophy of the project was well beyond what was originally conceived and was reaching far into some very fundamental technologies. Each of those technologies could probably be justified on its own, but when you look at four or five major new technologies, each of which might have a 50 to 60 percent chance of success, your project's overall probability of success decreases very quickly.

So after a good deal of thought and further discussion with the other executive committee members, I canceled the project. It's important to recognize that it was my decision — not that a lot of people weren't involved in discussing it and recommending things — but ultimately it had to be my decision.

**I:** Were you surprised at the reaction outside of the company — by the media and the investment community?

**J:** To some extent, but not totally. I was disappointed by some of the negative aspects of the press coverage, particularly in those cases where the media played up a personal rivalry between Steve and Seymour, which really did not exist. But then, I understand that that's what makes the story interesting, so what can I say? Basically, the reporting was quite accurate. If you ignore the sensationalism, all the facts were

there. I'm very happy with that, and I got a few complimentary letters from analysts and shareholders outside the company thanking us for really getting the news out as quickly and effectively as we did. I also got a few letters from people inside Cray that were very supportive, saying it must have been a hard decision but the right thing for the company to do. I really appreciated that.

**I:** Looking back, would you handle the situation any differently?

**J:** As far as the MP project cancellation is concerned, no. But, looking back — of course with hindsight — I wouldn't have started the MP project in the first place. It's clear that the project did not work out — it was a failure for Cray Research. Therefore, I have to say that it would have been better not to have done it.

Also, I think that neither Steve Chen nor Cray Research was well served by the "star" status that began to surround him. And I have to take the responsibility for letting that happen.

**I:** Were you surprised that so many people went with Steve?

**J:** No. I think that Steve put together a team that's motivated and really believes in the project. I think that many people in the MP project had some misgivings about the scope and size of the project within Cray, but they really wanted to make it work, and it was a major disappointment to them when the project was canceled. I can certainly understand that. I should say, though, that the large majority of the people from the project are staying with Cray and are being employed in other projects.

**I:** How do you feel about Steve as a competitor?

**J:** First, Steve is a long way from being a competitor, at least if he continues the project with the same objectives and on the same scale.

He is probably five or six years from being a competitor.

Second, I really believe that the technical approach that exists at Cray is appropriate for a company of our size, with our resources, our kind of people, and our creativity. And what Steve wants to do is develop a project that, in my mind, would be more appropriate in a much, much larger organization — one that can place five fundamental technology bets simultaneously.

We sell supercomputers. That's *all* we do. So the MP project would have to work perfectly for us to get any value out of it. In a larger corporation, the MP project would not have to work perfectly to provide value. Let's say the lasers worked but the substrate didn't work — fine. A big company like IBM or NEC could use the lasers in other ways. We're not set up to do that, and we don't want to be set up to do that.

**I:** You've said our company can only support two product lines. If a third product line came along that could be justified technically, would we forego it?

**J:** I don't think we're locked into a two-product philosophy. For one thing, I'm not sure that we even have two product lines. What we have is a range of supercomputers. To make such a strong distinction between the CRAY X-MP line and the CRAY-2/CRAY-3 line can be a little misleading. The fact is that there are close relationships. The processors in the CRAY Y-MP and CRAY-3 systems have very similar instruction sets. The difference is the addressing structure, which Seymour changed to make the CRAY-2/CRAY-3 work with much larger central memories. But there's a lot that's alike. One of our objectives is to allow customers to move between those two architectures with as much freedom as possible.

And within the context of making the most powerful computers in the world, we'll leave no stone unturned. We want to be creative. We want to try new ideas. We want to

explore new ways of doing things, and we should not handcuff ourselves by saying, "We have one specific idea of how these computers are built, and that's all we're ever going to do." That would be nuts. And that really wasn't the issue with the MP. I want to emphasize, from my perspective at least, that if we could have the MP working today, it would be worth much more than \$100 million or even \$150 million. The problem with the project was that I didn't think it was going to work, period.

**I:** Where does the Cray Style fit? How do you think it has been affected as a result of this situation?

**J:** First, the Cray Style provided an opportunity for Steve and his team to play an important role at Cray Research in developing the CRAY X-MP and Y-MP systems. It also provided a process for these people to develop as individuals.

Second, the Cray Style provided an opening to set up yet another new project — to create the MP project in the first place.

Third, the Cray Style provided the freedom for the team to spend two years on the MP project and to give the project a thorough opportunity to succeed.

But ironically enough, it was probably the Cray Style that also stopped the project. The cancellation of the project, is in my view, a very strong reinforcement of the Cray Style — a reaffirmation of the Cray Style. Again, what the Cray Style boils down to is small groups of people taking on major projects with a lot of autonomy and with a lot of creativity. And what that means, by definition, is there are not a lot of resources or people. Projects succeed because of our ideas and energies, not because we've made huge investments in fundamental research or capital equipment. We're going to succeed because we get a group of bright people together and just go for it. One of the words or expressions I used a lot talking to Steve was "street smarts". It's that we put together "street smart" groups

# 10.....

to do various projects. We live by our wits and that's very much a part of the Cray Style.

The MP project clearly had moved away from that — substantially and purposely. Steve is a great believer in the need for large-scale technology to build these machines. And I have to admit, it's true. In the CRAY Y-MP system, for example, there is some very large-scale technology. The difference is that Motorola invented it — we didn't. We're able to take advantage of that high-tech, space-age stuff; but we take our suppliers' technology and put it together in unique creative ways that nobody else has done, and we come up with a computer that can do things that nobody else's computer can do. Certainly, we need to see progress in fundamental technologies. I won't deny the fact that we need fundamental technology to be discovered and to be worked on. But, we don't need to do it ourselves, and that gives us, in my opinion, the fun of working with everything that's out there. When we choose technology it's like being a kid in a candy store. There's all this technology out there, and we can pick and choose stuff and put it together in very creative ways. And that's where our value is added. And it turns out that Seymour has demonstrated this approach for 30 years now.

**I:** What does the future hold for Cray Research?

**J:** There are lots of things that are very positive about the MP project experience.

One of the first things to remember, however, is that this is not the first time such change has happened. There was a project called Cray Labs out in Boulder, which was cancelled like the MP. It was a smaller group of people, but it was just as traumatic for the people involved, and for the entire organization.

I hate to say it, but it will probably happen again. Failure is a constant presence. It's part of life. But failure does not mean you're a bad person. Failure does not mean that your career is over. Failure is never easy —

never fun. But again, it's a fact of life.

Out of that failure, however, comes a lot. First, as an organization we have regrouped beautifully to provide opportunities for almost all of the people from the MP project to be part of another project. I'm very proud of that. Les Davis and the human resources people in Chippewa Falls have done that beautifully. There also have been many legal issues involved in the project cancellation — technology agreements and so forth — and Dave Frasch really has worked hard to keep that under control. Plus, working with the financial implications, John Carlson and his people in Chippewa Falls like Gordy Lindsay and Irv Engebretson have really rallied around us. So the organization has responded extremely well to the shock of the change in terms of healing the organization after the surgery's been completed.

But what's most important to keep in mind is that the company, with or without the MP project, stands at the forefront of technology. We have major development projects going on: we're continuing the CRAY-2 system, the CRAY Y-MP system is just about to come out, we're initiating the follow-on to the CRAY Y-MP system, and the CRAY-3 system is entering the prototype assembly stage. And Seymour is talking about the CRAY-4 system now. Our software efforts are similarly moving forward on challenging objectives. There are a large number of new thrusts.

I hope the MP experience will help keep us from becoming a typical large corporation throwing major bucks at development efforts in hopes that something will work. It certainly has reaffirmed the way we do things at this company — it is still possible for a small group of people that are really motivated and excited about an idea to put together a project and prove it on their own. And it doesn't have to be a \$100 million deal with all kinds of facilities and major equipment. It can be a very manageable kind of project — and the heroes in the company will emerge that way. •

## News Briefs

### Margaret Loftus leaves Cray Research

Margaret Loftus, vice president of software, left Cray Research on Wednesday, September 9.

Margaret joined Cray Research in 1976 in the software development area. Her initial efforts focused on the development of major Cray software products, including the Cray operating system, the Cray FORTRAN compiler, and utilities and station software.

In 1980, Margaret was named vice president, software development. Her responsibilities encompassed the overall direction of the company's worldwide software development efforts for new and existing hardware products.

### Bruce Kasson resigns

Bruce Kasson, vice president of marketing and customer operations, left Cray Research effective Friday, October 9.

Bruce joined the company as national sales director in 1980 and was elected vice president in 1981. He has been in his latest position since last year.

Bruce resigned from Cray Research to become a partner in a newly established executive recruiting firm.

### Steve Chen leaves company

Steve Chen, senior vice president since 1985, left Cray Research to form his own company. Steve was the chief designer of the CRAY X-MP supercomputers and has been committed to pioneering multi-processor architectures for use in commercial environments. His new firm, Supercomputer Systems, Inc., will be located in Eau Claire, Wis.

## 1988 scholarship program opens

**DEADLINE  
1/15/88**

Introductory packets announcing the 1988 Cray scholarship program were mailed out to all eligible employees in October. If your children are interested in applying, the request form included in the packet should be sent to the Citizens' Scholarship Foundation of America, Inc. (CSFA), 1505 Riverview Road, P.O. Box 297, St. Peter, MN 56082. The deadline for application submission is January 15, 1988. Awards will be announced early in March.

The Cray Research Scholarship Program provides annual financial scholarship awards to eligible children of Cray Research employees in the United States. New award winners are chosen each year on the basis of academic merit and extracurricular activity. Selection of the winners and administration of the program are handled by CSFA.

For those students who are continuing on Cray scholarships, reapplication is not necessary; CSFA will send out renewal forms in December. The new tax law requires that a portion of the award be taxable income to the parent. All scholarship recipients will be advised.

Questions about eligibility or any other aspect of Cray's scholarship program can be directed to Karen Annexstad of CSFA at (507) 931-1682.

## U.S. Army orders CRAY-2 system

On October 1, Cray Research announced that the U.S. Army has ordered a CRAY-2 computer system valued at approximately \$20 million. The system will be purchased and installed at the Army's Tank Command base (TACOM) in Warren, Mich., in the first quarter of 1988.

TACOM engineers will use the system for planning, designing, and

developing the next generation of Army tactical vehicles.

## New customer orders CRAY X-MP system

Another release on October 1 announced Argonne National Laboratory's CRAY X-MP/14 order. The system, valued at approximately \$5.8 million, will be purchased and installed in the fourth quarter of 1987 at Argonne's research laboratory in Argonne, Ill.

David Weber, manager of computing services at Argonne, said, "The new computer will provide the foundation for a long-term computing capability that can be upgraded to meet Argonne's future scientific computing demands."

## Crav Research reports third quarter results

On October 28, Cray Research, Inc. reported revenue of \$184,640,000, and net earnings of \$36,114,000, equal to \$1.14 per share, for the third quarter ended September 30, 1987. This compares with revenue of \$136,579,000 and net earnings of \$26,117,000, equal to 83 cents per share, in the third quarter of 1986.

Revenue for the first nine months of 1987 was \$523,726,000, compared with \$458,502,000, for the first three quarters of 1986. Net earnings were \$112,993,000, versus \$101,482,000 a year ago and earnings per share were \$3.57, compared with \$3.24.

During the third quarter, the company installed nine new computer systems, all purchased, and reinstalled four computer systems, two of which were leased. The company's results are influenced significantly by the number of computer systems accepted during the period and by whether the systems are purchased or leased.

John Rollwagen says, "We installed 33 new systems and eight used systems in the first nine months of the year, and we expect to meet our target of a total of 55 new and used systems for the full year. We have now set our production schedule for 1988, based on the assumption that we will install 60 to 65 new and used systems next year."

Commenting on the order outlook, John continues, "The Company signed 31 contracts during the first nine months of the year. Current negotiating activity would indicate that we will meet our year-end order target."

## CRAY RESEARCH, INC. AND SUBSIDIARIES Consolidated Summary of Earnings (Unaudited)

(In thousands, except per-share data)

	Three months ended September 30		Nine months ended September 30	
	1987	1986	1987	1986
Revenue	\$ 184,640	\$ 136,579	\$ 523,726	\$ 458,502
Operating costs and expenses	130,038	91,611	350,484	278,268
Operating income	54,602	44,968	\$173,242	180,234
Other income	3,336	2,830	8,156	6,691
Earnings before income taxes	57,938	47,798	181,398	186,925
Provision for income taxes	(21,824)	(21,681)	(68,405)	(85,443)
Net earnings	\$ 36,114	\$ 26,117	\$ 112,993	\$ 101,482
Earnings per common and common equivalent share	\$ 1.14	\$ .83	\$ 3.57	\$ 3.24
Average number of common and common equivalent shares outstanding	32,501	32,290	32,470	31,947

## BenefitsPlus

### Long-term financial planning...in Cray Style

The following article pertains only to U.S. employees. Employees of Cray Research who work in one of the international subsidiaries should contact their human resource representative for information on long-term financial planning vehicles available at that location.

According to the U.S. Bureau of the Census, the fastest growing segment of our population is people of retirement age. Today, one out of every ten people in the U.S. is age 65 or older. By the year 2030, it is expected that one out of every five people will be of retirement age. Contributing to this demographic trend are increased life expectancies and an increasing trend toward early retirement.

### Long-term financial planning and the 401(k)

Many factors must be considered before retirement: health programs, leisure activity — but first and foremost, financial planning. How much income will be available and from what sources? What kind of payments can be expected from

Social Security, if any? How much will a company retirement plan pay each month?

Retirement income is often perceived as a three-legged stool: social security, employer retirement plans, and individual savings. Long-term financial planning is a process that can never be started too early. Even when just beginning a career, it is important to save money so that interest can accrue over time.

In an effort to help employees plan for retirement and direct themselves toward a sound financial plan, Cray Research offers the Deferred Profit Sharing and Investment Savings (or 401(k)) Plan as a vehicle for personal saving. People who participate in the 401(k) Plan authorize Cray Research to put from one to fifteen percent of their pay, before taxes, into the plan. Profits permitting, plan participants receive 50 cents from Cray Research for each \$1 of their first \$2,000 of savings each year.

### A company objective

Long-term planning should be approached as an individualized process with individualized answers.

The thrust of Cray Research's current and future pre-retirement efforts is to provide employees with

information that will assist in making informed decisions. The company's 401(k) Plan is a program designed to help employees prepare for this major life transition.

If you have questions or comments about Cray Research's 401(k) Plan, please contact your local human resources representative or a member of the Deferred Profit Sharing and Investment Savings Plan Administration Committee.\*

\*Members of the committee are: John Carlson and Bob Gaertner of Minneapolis and Don Whiting of Chippewa Falls.

### Another savings option

As a result of the 1986 tax reform act, employees who are eligible to participate in the 401(k) Plan are limited in the amount of tax deduction they receive for contributions to an individual retirement account (IRA). However, IRAs are still a valuable option in financial planning. Earnings on IRA contributions of up to \$2,000 (\$2,250 for a married couple with a non-working spouse) continue to be eligible for tax deferral, regardless of the level of 401(k) participation.

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